

# AVIATION

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MARCH 22, 1926

Issued Weekly

PRICE 15 CENTS



The House of Parliament, Ottawa, Ont. with Hull, Que. in Background

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VOLUME  
XX

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NUMBER  
12

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# AVIATION

VOL. XX NO. 12

MARCH 22, 1926

Published every Monday

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GARDNER PUBLISHING COMPANY, Inc., Publishers

BUSINESS AND EDITORIAL OFFICES, 225 FOURTH AVENUE, NEW YORK

CABLE ADDRESS: AVIATION

PUBLICATION OFFICE

HIGHLAND, N. Y.

Subscription price: Four dollars per year. Canada, five dollars. Foreign, six dollars. Single copies, fifteen cents. Back numbers 25 cents. Copyright 1925, by the Gardner Publishing Company.

Issued every Monday. Terms: advance ten days previously. Entered second-class matter May 22, 1920, at the Post Office at Highland, N. Y., under act of March 3, 1879.



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# AVIATION

VOL. XX

MARCH 22, 1926

No. 12

## The Trend of Air Transport Development

THE trend of development of a new air transport is in the natural and general trend to aeroplanes and it possible from the experience of others who have been active in the particular sphere under consideration. This has proved true of air transportation and its development in this country is not being undertaken without a full knowledge of the activities of a similar nature abroad. Much has been said and written on the air transport activities in Europe but, so far as the United States is concerned, attention of the greater part can be found in the new well known Southwestern of Colombia, South America. Elsewhere in this area, attention is being able to publish a very complete and thoroughly authentic account of these activities.

Not only has the Southwestern proved the possibility of reliable air transportation for both air mail or freight and passenger but its success, together with the successful operation of Colombia in the United States, makes the activities of great importance to air operations here, now, with the development of air transport will follow the same operation of all activities, just as railroad systems operate today.

The success of the Colombian air transport company is largely a result of the conditions under which the operations are carried on. These are such as to lead themselves naturally to the form of travel, all other means of communication on the three great continents except which out through the country being reasonably possible.

First the type of transport service with which an airline has to compete is of extreme importance and influence upon the success of the air transport of travel it very strikingly shows in the record of the Southwestern operations, for there is recorded a very marked difference between the amount of traffic carried on by air in the opposite direction. The difference is made evident, something in some cases to about as much as 100%, are explained by the fact that the time taken to do the journey for the distance is, certainly, less directness than in the opposite direction, and, consequently more passengers avail themselves of air travel in the direction in which the gain in speed is greatest.

One extremely interesting question raised in connection with air transport operations is the development of equipment. The Southwestern is likely to give considerable attention to development. It is a general truth that the air transport companies to adopt the type of aircraft available which appears to be most suited to the requirements. The practice of air transportation recognizes developing their own aircraft is, however, by no means new. The Junkers air transport company at Germany, had, until the recent German members, long followed this practice and the Junkers manufacturing company worked in close accord with the airlines, acting as an intermediary between the technical airplane designer and the practical air transport operator. That an air transport company should necessarily

in a manufacture of airplanes is by no means the case, but experience would indicate the need for the closest cooperation between operators and manufacturers in order that the latter may fully understand the requirements of the former and the former the needs of the manufacturer, so far as economy in production is concerned. That the Southwestern has required equipment very suitable to the demands of its air services must be acknowledged since their operations have met with such success.

## Small Multi-Engine Planes

THE TECHNICAL advancement in the design of both airplanes and engines is making possible the building of a three-engine plane of comparatively low horsepower. Although these small engines would have weighed very much more than one engine of equal total horsepower. Recent developments, however, have resulted in the construction of small commercial engines which, while heavier per horsepower than a single large engine of modern design are still considerably lighter than older types of engines which are used in many single-engine commercial planes. This and simpler engine mounting have made possible, at least theoretically, the building of a small three-engine plane of reasonably good performance.

There is a vast difference, however, between being able to build an airplane of a certain type and being able to sell it commercially. Superficially, the lower fuel cost, better performance and cheaper maintenance of the single-engine plane, would seem to give it an advantage. However, there are certain operating conditions where the greater practical freedom from forced landings would make a real saving in total cost. Patrol patrol flights over certain regions, once-water flights in head winds and certain kinds of night and day flying, are typical examples where the operation of a multi-engine plane would, in the long run, be cheaper than a single-engine machine. There are also, of course, advantages and disadvantages where the advantages in the event of a forced landing and the chance of being unable to salvage the plane are such as to make the multi-engine plane superior for regular commercial operations. Thus, as also, probably, a certain number of wealthy men who would pay the extra cost of writing a plane with greater reliability and safety.

The engine themselves would not cost much more per horsepower than a single engine as there would be more units produced and the engines could be used in smaller single-engine planes. Also, one spare engine ready to replace, and one undergoing overhaul, would be sufficient and would keep a steady flow of work in the shop, whereas in a large single-engine plane, two spare power plants may be needed, one for emergency replacement and one for replacement. These small engine units can also be handled by a smaller crew and a greater variety of types can be kept on hand.





it has, unknown that look by transporting within its own organization, and under its sole responsibility, will, express passengers and passengers from any point of origin to the airplane point of destination.

In analyzing the use of this plane, known as *Scapda*, we shall find that a considerable percentage of the aircraft operations in foreign countries, neither percentage has been brought in by special flier lines from other coastal cities, such as Cartagena, Santa Marta and Guayaquil, while the remainder has been delivered by local customers in Barranquilla. The same is true of passengers. Some may have booked their air passage before leaving from Bogotá, or from other points, such as Cartagena or Barranquilla.

The airplane flies from Barranquilla to Guayaquil, the airport of Bogotá, at about 10 hours, at well within the daylight hours of any day. The direct route is from Bogotá to Guayaquil, which, when it connects with an air line to Barranquilla, at Barranquilla, where it serves the greatest of fields of Colombia, at Santa Marta, the airport at Medellín, at Bogotá, where connections are made with Bogotazo, and finally at Guayaquil, where the line is distributed by air to Rio de Janeiro, to Western Colombia and Bogotá, by air to the Pacific, to the Atlantic, to the Caribbean, and to the Pacific. Representatives of the Scapda Company like the shape of such express goods and passengers on the morning, from it, and from the airport. The land is further-  
more protected by a good system.

It is important to note that the company's routes have been obtained not solely by the development of its flying service, but by a licensed line serving through the provision of directly connected connections to the different points in the only country in the world having a Federal law which provides that every railroad must organize a special service for express in connection with service and express operations on its established air routes. The air mail line of a letter from Barranquilla to Bogotá formerly was 36 hours, due to poor terminal connections, with service on the railroad between the airport at Bogotá and Bogotá has reduced this time to 24 hours. A letter by military mail (river steamer) from the coast to the interior would, under normal conditions, take upward of 30 days for delivery. It therefore readily understood, that the greatest advantage the public has derived from the air service has been the well-  
known air mail service of the Scapda Company. The passenger service is almost equally important, and the airline has given later in this article proves the steady growing use of the plane for passenger travel, the number of passengers since showing a marked increase with every year.

So much for the important transportation factor of the Colombian air service. The factors of Safety, Reliability and Comfort must now receive some study.

#### Safety

Aviation has now developed sufficiently to guarantee a satisfactory degree of safety in the operation of a properly equipped commercial line. Relatively speaking, safety will depend on the selection of a well trained and reliable personnel, the selection and development of an efficient type aircraft, and finally the provision of an adequate ground organization. Pilot, engineers and mechanics must consequently be of the highest type available. The work of a commercial pilot is perhaps less attractive than that of a military flier, but the company will have to depend largely on his sense of responsibility, his desire to avoid extraordinary risks, and his method preference for the avoidance of a smaller and more frequent risk than for the chance of a "hot shot flier" and the actual explosion. This has been the first policy of the Scapda Company in the selection of personnel and the operating record of the past four years proves the soundness of the idea.

Similarly, an airline company must not ignore the most modern and efficient type of flying equipment available. In this world, where the need is felt for the efficient and well-  
equipped conditions under which the air must operate. To secure the best results for itself, the company must devote a suitable amount of effort and money to the development of improved types of equipment especially adapted to its own needs. For the Colombian air-service, the Scapda Com-

pany has selected an all-metal *Scapda* airplane with a capacity of 450 lbs. payload, exclusive of the crew of two (3 pilot and 1 mechanic) and of gasoline for 4 hours flight. The equipment of this type equipped with 150 hp. BMW engines are operating today on the company's fleet. Two *Scapda* landplanes are in operation on a subsidiary line between the Magdalena river and the high plains of Guantánamo (Champana), by an associated company, known as the ODEADA. Climate conditions in the tropical rain forest for an 8-hour plane, and a capable, loaded, restricting substantially to the safety of the line, it is necessary. It requires no special landing fields, which in tropical countries are prohibitively in cost of construction and maintenance. During the flight, an emergency landing can be made at any moment. Bad weather, fog, trouble with engines and plane, are insufficient at a passenger can be moved by an emergency landing on the river.

Scapda service line also the important advantage of offering, from a legal standpoint, a commodity to the merchant marine, facilitating the establishment of a legal status for the ship owner by direct modification of the laws and regulations applicable to shipping.



The Scapda air route of Colombia

The Scapda Company has its principal airport in Barranquilla, where it has a small one of the most difficult of repairs. This is today probably the largest, best airport in Latin America. It affords landing and hangar facilities and well equipped repair shops for *Scapda* planes as well as for the larger *Boeing* and *Boeing* types. In addition, another airport has been built in Guantánamo, and in several small airports, service with some ports, and landing facilities have been established. Delays and maintenance between the different airports where it is in a situation, although its efficiency could be improved.

No transportation enterprise is absolutely free from accident. The Scapda is no exception in this respect. During a special demonstration flight, just completed with its regular service, a *Scapda* met with disaster, resulting in heavy loss of life. Apart from this, however, during the long run of the years of uninterrupted operation on its regular schedule, no serious accident has occurred, no passenger has been killed or even seriously injured and no mail, goods or valuable lost. The insurance rates for vehicles transported by the Scapda are lower than for transportation by any other means. Likewise the insurance rates for the plane themselves are remarkably low, compared with the rates other air-line have to pay.

#### Reliability

The air mail service in Colombia is operated on schedule and every effort is made to insure that schedule to the minute. Every Tuesday and Friday, at 5:00 in the morning, the airplane leaves Barranquilla and are due to arrive in the different airports on schedule time. The subsidiary air lines and the subsides are used to connect with the scheduled service of the principal air route. Arriving and departing planes connect in Barranquilla with the most direct routes from the United States and Europe. Only 100 per cent of the scheduled flights have been so delayed on the main air route from the interior of Colombia. Unusually bad weather was responsible for these delays. Connections with mail streams, however, were generally more reliable, and it was so sufficient that it is allowed for another plane to bring in mail and passengers when the regular mail-plane is unable to proceed on schedule.

Within the near future it is planned to establish a bi-weekly service along the coast, after from Barranquilla to Guantánamo.

#### Comfort

A certain amount of comfort in the service is a whole business is a factor responsible for the success of the enterprise. The Scapda passengers travel in an air-conditioned and well protected cabin, in their ordinary clothes, undisturbed

by air-currents or bad weather. The company's office and airports have ideal locations, the former being in close proximity to the Colombian National Post Office and the latter near the river-steamers piers. Various landing fields for airplanes generally are located far from the city, airplane ports are established conveniently near the center of the community. But it is not only necessary that a trip by plane to the interior and vice versa be made as easy and pleasant as possible to the passenger, the general organization must also be sufficiently simple to cause no confusion in the mind of the public, when sending mail, express packages or valuable. For this reason, the Scapda Company was forced to build up its own service to the point where it forms a transportation system for mail, express, valuable and passengers from any point of origin to point of final destination. In any country, but especially in tropical countries, any division of responsibility for the transportation service would place a severe burden on its reliability.

#### Value of Traffic

The following table shows the development of traffic within the Scapda organization during the past five years.

Year	No. of flights	No. of passengers	No. of mail pieces	No. of express packages	No. of valuable	No. of cargo
1951	1,000	10,000	1,000	1,000	1,000	1,000
1952	1,200	12,000	1,200	1,200	1,200	1,200
1953	1,400	14,000	1,400	1,400	1,400	1,400
1954	1,600	16,000	1,600	1,600	1,600	1,600
1955	1,800	18,000	1,800	1,800	1,800	1,800

Figures only.

It will be noted that there is a constant fluctuation in the mileage figures, due to non-scheduled flights, but the number of letters carried, the weight of the air mail, and the amount of express packages show a steady growth from year to year. During 1955, there were 300 scheduled and 813 non-scheduled flights, made over the main route. Barranquilla-Guayaquil, a distance of 625 miles. The average load of a plane, flying to Guayaquil, was 59.95 of the capacity, or the *Scapda* plane, 795. The river steamer making the trip to the coast at a higher speed than up the river, the



A Scapda Airplane Flying Along the Magdalena River, Colombia





of 50 hours, at 1,000 r.p.m., the bearing showed practically no wear. A 50-hour test at 2,000 r.p.m. will be completed shortly.

The injection system consists of three circular passages placed side by side, each one supplying three cylinders. These are joined by a manifold and connected to a flexible distributor with a fluid chamber located between the two cylinders, in so to maintain a constant level in all firing positions of the cylinder. Slightly higher main effective pressure can be obtained with three separate injectors, but the difficulty is in service of maintaining the adjustment of these separate subcarrier units, especially in the closed throttle position, leads us to believe that it will be worth while to design a triple injection carburetor.

As can be imagined, in a power plant rated at 200 hp. and at very steady maintenance, the run per hour-power will be somewhat high. In this case the weight is 445 lbs., at a rate of 2.34 lb. per hp., which, nevertheless, compares favorably with water-cooled engines of the same power, when the water and radiator are taken into account.

It would be impossible to cover the field of air-cooled engine development properly without touching on the work of Messrs. R. B. Heine, one of our contributors, and R. T. Jones, both formerly of the Power Plant Section of the United States Army Experimental Station at McCook Field, Dayton, Ohio, and now registered with the Wright Aeronautical Corporation. These men have carried on a series of single cylinder air-cooled engine tests, following up the work done during the war at Fairbrough, in which Mr. Heine modeled Mach of this work has been published. So I shall touch only on a few points.

#### Valve Troubles in Air-Cooled Engines

The most unsatisfactory detail of the air-cooled engine has been the exhaust valve and guide which, with non-refractory design, could not last more than about 50 hours at full power, in a cylinder developing 40 hp. The valves are red at the junction of the cone and neck and finally failed at that point. The guides quickly wore out. A form of maintenance was developed with a five-barrier valve, having a seat diameter of 3½ in. and guide fitted with web, consisting of 45 per cent valium nitrate and 55 per cent red phosphorus nitrate (by weight), and running in a lead tungstate steel guide. The valve seating was much improved and the hot cone was

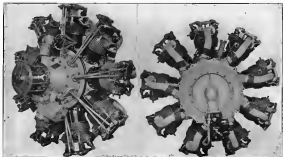
greatly reduced in area. After 100 hours of full power running, the last 50 hours being properly under conditions of varied auto speed, seating on the neck of the valve was evident, but very little was observed on the stem. In the run on the right of the slide the condition of the valve after the test will be observed. The valve on the left is an unfired



The inverted Air-Cooled Liberty Engine installed in the C-6 Observation Plane

valve after a 50-hour test. Due to a better fitting, heat was eliminated, although running merely excellent performance.

These and other experiments in air-cooled radial valves have been very valuable, not only for screening, but also for



Two views of the Corbin R-1045 Radial Air-Cooled Engine

water-cooled engines, which often run unsatisfactorily better than the valves referred to above. A practical application of the foregoing has occurred in the servicing by the Wright Aeronautical Corporation of a large number of mixed Model R, 500 hp. Niagara engines, built by our company during the War. With slight modifications the exhaust valves are still filed, giving the engine a life between overhauls three times as long as before.

#### Cylinder Experiments

Another interesting development has been carried on around a smaller cylinder at 6½ in. bore. One of these was made up of cast iron with surprising results. The cylinder developed 160 brake mean effective pressure, at 37.5 lb. p.s.i. at 1,800 r.p.m. The temperature of the head at a point on the cylinder wall was recorded as high as 750 degrees Fahrenheit. Despite the high head temperature, excellent cooling was obtained with the water-cooled valve, the hottest side being in the middle of the neck about ½ of an inch wide and just completely red.

At the completion of these tests the box was removed from the cylinder and head and a water jacket welded in place. No difference in performance whatever was noted, but the valve seating was somewhat improved, the valve running detail being. The seating of this cylinder and valve, in which it is as water cooled form, is the best example of valve seating of which I have any knowledge.

One of the most interesting developments of recent years is the reversed Liberty, referred to earlier in this paper and developed by Messrs. Jones and Heine. This is a most satisfactory power plant, developing 428 hp. at 1,800 r.p.m. but seemingly somewhat heavier than could be the case if it

were a completely new design and not an adaptation, but nevertheless 200 lbs. lighter than the water-cooled Liberty with radiator and water. As 35,000 new Liberty engines are still in storage and as the water system are beginning to corrode and become unreliable, the importance of this development from a maintenance and economic viewpoint, as well as for its military value, is quite evident.

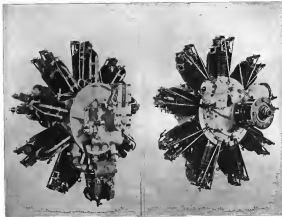
In order to obtain sufficient space between the cylinders for proper air cooling, it was found necessary to reduce the gap between bore to 4.8 in. instead of 5 in. as formerly, and to get the power by higher mean effective pressure and higher revolutions. With the water-cooled Liberty 1,700 r.p.m. was the highest speed at which the engine could run satisfactorily, but with the lighter supercharging parts and smaller piston areas of the air-cooled engine, speeds of 1,800 r.p.m. are satisfactorily maintained.

Having a few minor changes, the rest of the engine, except the cylinder, valve gear, piston and injection system, remains the same.

The cooling is obtained by means of a scoop, as in some of the early English and French air-cooled V-type engines, which provides only means of drawing in cold air. The distribution of cooling air to the various cylinders is much less troublesome than was anticipated, no baffles or deflector being necessary.

#### Supercharger Installation

An interesting and novel feature of this engine is the installation of a built-in, gear-driven, low velocity supercharger, which adds practically nothing to the weight of the engine. A smaller supercharger, installed as a Corbin R-1045 engine, added five pounds to the weight of the engine, as against 40



Two views of the 200 hp. Wright Wheland radial air-cooled engine

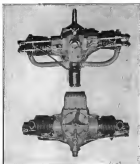
the quality of parts that is required. As it present installed, this supercharger is nothing more than a rotary inductor system, in which the air is taken in from your Armstrong-Ditcheley engine, and from the point of view of distribution alone it is a very modest device. We believe that it will be possible to supercharge to altitude of perhaps 10,000 ft., but so far we have only tested it in the air under conditions where a successful outcome at ten to three miles of mercury was obtained. The value of this type of supercharger, therefore, is as yet to be determined.

The foregoing of course, refers to superchargers built as an integral part of the engine. This general problem of supercharging has received a great deal of attention and some fairly satisfactory results have been obtained. The turbo and centrifugal types have been investigated by the Engineering Division of the Air Service, co-operation with the General Electric Company, while the Root type has been studied by the Navy. (In connection with the National Advisory Committee for Aeronautics.)

#### The General Electric Supercharger

The General Electric turbo supercharger has been developed into a highly reliable and satisfactory piece of equipment. This supercharger is designed for application to engines of the 50-500 hp. class and has a nominal rating of 20,000 ft. However, by overcompressing, actual pressure may be maintained at the exhaust up to altitude of 30,000 ft. To promote this supercharger follows the line originally established by Brown, but in the matter of arrangement and mechanical detail, it departs entirely from the Brown design. The supercharger is located at the side of the engine, with the turbine on the exposed side for cooling. The compressor

Experiments with the general centrifugal supercharger have been largely devoted to the development of a reliable driving train. While a thoroughly reliable and satisfactory design has not yet been developed, some very encouraging results have been obtained, and those directly connected with the development are confident that the difficulties will eventually be overcome. This type of supercharger will probably be built.



The Wright Whetstone engine. In the top view the engine is seen from the propeller shaft end, while the lower picture shows the engine from above.

operated with a moderate altitude rating (say 10,000 ft.), having the exhaust on the radial side of the compressor. The turbo type will continue to be used for very high altitudes.

The development of the Root type supercharger by the National Advisory Committee has now fairly succeeded. A compact, reliable and rugged design has been developed, and this type promises to compete with the turbo type for altitude ratings of 20,000 ft. and up. This type possesses the advantages of extremely simplicity and ease of construction and, due to its moderate speed, the gearing and drive mechanism required to effect its operation are simple. The fact that this type does not lend itself to the arrangement with the compressor on the reverse side of the compressor would seem to give the centrifugal type the advantage for moderate altitude work.

#### An American Light Plane Engine

The only light plane engine in production in the United States is the Wright Whetstone engine, designed by H. P. Manly and now manufactured by the Wright Aeronautical Corporation. This little engine is a two-cylinder engine of a type much more familiar to the British and French aviators than to our construction in America. It has a cylinder bore of 30 in., which is the standard in the United States for light plane engines, and has been designed for low and moderate quantities as much as for high performance. For this reason, our two cylinders have been overpacked with a rather tight head with some number of valve problems in view of design production as to be in much of its many years as possible. Nevertheless, the performance is very creditable, brake mean effective pressure of 137 being easily obtained. The outstanding aids are dashpots springs, lubricated directly on the dashpots. Ignition is obtained from a single

two-cylinder magneto. In spite of the cast iron cylinders, the weight is not excessive, being only 55 lbs., and the horsepower developed is 30 hp. at 1,500 r.p.m., giving a weight power ratio of 2 lb. per hp.

#### These American Radicals

There are three large radial engines being developed in the United States at the present time with satisfactory results. They are the Wright Whetstone, an engine of 1,200 hp. in, developing 350 hp., which has just completed a full 30-hour test at 1,500 r.p.m.; Curtiss Radial, of 1,454 hp. in, and 400 hp., in new endurance acceptance tests at McCook Field, and a third ready to be put into production, the Wright Cyclone, a 625 hp. engine, of 1,625 cc. in., with a bore of six inches and a stroke of 6½ in., in new endurance acceptance tests for the United States Navy.

The modern valve gear will be noted in all these engines, due to the belief that the operating parts should be properly lubricated and the valve springs protected from spray when used in turbulent conditions.

Failure of exhaust valve springs has often resulted from the sudden shifting due to spray from the flash or propeller. Another important reason for the exhaust valve gear is the one with which an exhaust valve gear looks itself in comparison, a very important factor if durability is a consideration. Wind tunnel experiments have shown that the gear on the top of an aero-cylinder offers considerable resistance and the gas is held back by the valve gear parts in a mechanical sense in by no means negligible.

As there had three engines are still in the development stage, I do not feel at liberty to give any very detailed information with regard to these designs, but believe that the photographs which I am showing will be of interest.

Another interesting development being carried on in the United States is the double cylinder. In its latest form this consists of a cylinder with a double combustion chamber, but having two separate inlets and independently driven pistons. Until recently there has been a very strong feeling against any engine except complete dual cylinder or multiple cylinder as a means of the possible failure of the drive at mid or because of fear of failure of the opposite half.

Successful aero-cylinder design depends largely on lack of crankshaft vibration, and in our modern engines, both water-cooled and air-cooled, this trouble, at least for the speeds we now run at, seems to have been almost entirely eliminated. Type a weight consideration shows the dual cylinder warrants intensive study and development.

Remembering our tendencies in aircraft design, I should say that in the water-cooled engines we have standardized on the 12-cylinder Vee type, in close compact as possible, of very rapid construction and with a rapid trend toward higher speeds of revolution.

#### Problems to be Faced

In the air-cooled we have for the most part the alternate type, but have at least put our cylinder cooling and valve troubles behind us, and are now attacking the problems of master rod and articulated rod construction that are involved in the tendency toward higher speeds of revolution.

As I stated before, the air-cooled piston is subjected to considerably higher temperatures than the piston of the water-cooled engine, on account of the motion of the master rod, much greater suddenly pressure in a two-cylinder engine, masters 4, 5, 6, 7. This especially means greater side pressure on these pistons and the master rod piston also is subjected to special side pressure, due to the action of the other cylinders upon the rod. All these conditions must be met by a balanced design, which will contain the outside diameter within as small limits as possible and yet provide satisfactory conditions for the operation of the piston joint mechanism. The big end of the master rod must be given sufficient stiffness to permit of higher rotation speeds than we used at present. In fact, there are a number of problems still to be solved before the air-cooled radial will become as standardized as the water-cooled 12-cylinder engine.

The Vee type air-cooled engine, on the other hand, now that its cylinder and valve problem are solved, can follow the general line of water-cooled technique and will, I believe, during the next few years become a very popular type whose overall length is not the droning factor.



The Wright R-1200 Brown Engine

is located between the turbine and the engine, and the compressor air passes from the compressor through an air duct to the front of the engine, thence into the Vee in the combustion valves. The air duct is located directly in front of the supercharger, thus keeping the total projected area to a minimum. This type of supercharger is definitely past the experimental stage and is considered as a standard piece of service equipment.



The Italian aero-craft design being brought out for a test flight. It is the single dual American engine to reach the North Pole this summer.





Joshiah, Captain Olinos, and Lieutenant Major Wrench are among those who consider it to be in a class by itself. Casey Jones claims that with a five hundred pound load and with Mrs. Jones and family (Mrs. Jones has five children between the ages of 5 years and 10) in the cabin, that his take off was only some three or four miles—a really quite remarkable performance. Lieut. Len Underhuck has not recovered sufficiently to make any statement regarding the ship other than the one mentioned above. However, Lieutenant Underhuck claims that he will use a parachute after this when testing any of Olinos's planes.

F. L. KAVERT,  
228 Chase St.  
Ann Harbor, Mich.

**Fourth Runaway—A Protest and Warning**  
I noted in your issue of February 23 an advertisement of The Gy Caldwell Airplane & Baby Buggy Co., Ltd. I am indeed gratified to be able to welcome to the ranks of the airplane industry an experienced manufacturing company, even though baby buggies may have been their principal product heretofore.

Upon considering the matter, however, it is obvious that there is much in common between the baby buggy business and the production of airplanes—they both have to do with an infant industry, for instance. It is notoriously easy to take money from a baby, which may explain the financial ability of the new entrant to the new winged skies, to take full page advertising space in your esteemed journal.

It is, therefore, with great pleasure that I bring to your attention facts which will undoubtedly show your advertising columns to this baby buggy airplane company, unless it meets the terms and conditions of my clinic, Mr. Harold D. Bell of Carter Hills, Ark., who is, I am prepared to prove, the original inventor of the Cybark. It was certainly a pleasure to note that this wonderful design is finally receiving the approbation that so many sterling qualities and engineering justified.

As one of the few surviving pre-war, pre-Valued Consulting Association Engineers, may I state that it was my professional privilege many years ago to assist Mr. Bell in the design and construction of the prototype of the Cybark. To substantiate this fact, I am enclosing two photographs showing the perfect construction at that time of two of the principal models.

You will note in the "A" model design the wing walking

possibilities are even superior to that shown by the Cybark and could, in fact, be used for demomstration of the Cybark at any altitude, which under modern conditions will insure a ready market for this particular design.



Model B—The Explorer Plane

In the model "B" type, the need of acceleration is quite apparent. Otherwise the machine would be utterly unmanageable. Thus, to my mind, shows that this important feature of the Cybark was anticipated by Mr. Bell's designer.

Mr. Bell has entrusted me to negotiate with The Gy Caldwell Airplane & Baby Buggy Co. Ltd., looking to their use of his design, and has indicated that in addition to the conventional "open licensing agreement," he will consider a stock interest in the parent company of approximately One Million Dollars, or so the record that a cash settlement is preferred, Mr. Bell will consider a two year extension of his term.

Continued on Page 432



Model A—Prototype of Cybark



#### THE OX5 TRAVEL AIR

FOR GENERAL UTILITY PURPOSES  
REQUIRING HIGH GRADE PER-  
FORMANCE, RICH OF CONTROL  
QUALITY AND SERVICE.

PERFORMANCE WITH 60 LBS. LBS.  
75% LOAD  
HIGH SPEED 100 M.P.H.  
LANDING SPEED 20 M.P.H.  
SERVICE CEILING 10,000 FT.  
PRICE, \$2,000. FLYAWAY WICHITA

## TRAVEL AIR AIRCRAFT 3-PLACE SERIES

#### THE C6 TRAVEL AIR

FOR PHOTOGRAPHIC AND EXTREME  
SIZE CROSS COUNTRY WORK.

PERFORMANCE WITH 60 LBS. LBS.

75% LOAD

HIGH SPEED 110 M.P.H.

LANDING SPEED 20 M.P.H.

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#### THE

#### WHIRLWIND TRAVEL AIR

FOR HIGH CLASS SERVICE IN  
WINDING & EXTREME OF POWER  
MAIL, TOURS, BUSINESS, OR  
CROSS COUNTRY WORK.

PERFORMANCE WITHOUT DOWN-  
LOAD WITH 60 LBS. LBS.

75% LOAD

HIGH SPEED 100 M.P.H.

LANDING SPEED 20 M.P.H.

SERVICE CEILING 10,000 FT.

PRICE, \$2,000. FLYAWAY WICHITA.



THIS MODEL ALSO SUPPLIED  
WITH HIGHLAND NOTES

WE SOLICIT  
CUSTOM BUILT  
AIRPLANES

TRAVEL AIR MFG. CO.

Manufacturers of the Travel Air Aircraft

WICHITA

KANSAS

LET US KNOW  
YOUR SPECIAL  
REQUIREMENTS



## AIRPORTS AND AIRWAYS

## Los Angeles News

By Geo. D. Harrow

Radio broadcasting of aviation progress and flying data is a regular feature of the work of the Long Beach Aero Club of Long Beach, Calif. This is done through broadcasting system KPTV on Long Beach, 225 meters, by arrangement made by the club, one of the nearest of the broadcasting stations and a leading member of the club. William Fox, commodore of the Aero Club, Earl Dougherty and Max Dougherty, Hal Nelson, who operate the station, are enthusiastic members of the program already given.

Telegrams and letters from many points to Station KPTV show an appreciation of the aviation progress which is being accomplished by the Long Beach Aero Club. Plans have been made for air service in distant points seem to be especially appreciation of the aviation progress.

The Aero Club programs are given every Tuesday evening from 8 p.m. to 12:30 a.m., Pacific standard time. The broadcasting station is owned by Nichols & Wyeross, Inc. The California Development Association, an organization of leading business men throughout California, is assisting the addition of an air service department to forward flying activity in that state. This was suggested by the association by means of the Western Aero League and the San Francisco Chamber of Commerce, which have responded by layout out a plan for aviation. Meetings to confer with flying authorities have been held at San Francisco and Los Angeles. If the idea is taken up, the association will spend a de-

pendent fund, who will give his time in furthering aviation in California, and will be available to manufacturers, designers of equipment and other organizations, especially in connection with the establishment of permanent aviation fields.

Ray Kuschner has just completed the design and construction details, at his home at Los Angeles, for a new type of fixed-wing aircraft. It is a design of a fixed-wing, gliding the use of steel and aluminum and carrying large capacity by eliminating interior bulkheads.

Kuschner has built and successfully operated twenty-one Douglas aircraft, including one with a capacity for twelve passengers, which he operated continuously for thirteen months. In his new design he embodies several novel results from his twenty years of practical flying experience. Among these are an increase and extra size also for incorporating an increase in speed, addition of mechanical steering devices which will greatly lessen the work of the locomotion and a new method of strengthening the hull without adding undue weight. The work of design and development plans has taken most of Kuschner's time for the past few years.

## Mobile, Ill.

By W. B. Muller

Moore field will be used for further as an airport for the first time in the United States at Mobile, it has been announced by Donald Burdett, assistant general manager of the National Air Transport, Inc., which holds the contract for the new Chicago-Mobile air mail route, which will serve the old-line. Mr. Burdett gives a report on the use of the field, made at

Croydon airport, London, and the tower and the observation tower lay and stand into a pond of old light which may be seen easily, since above the fog. It is said they have never been tried out in the United States.

The Trans Air plane, in which E. K. Campbell of Mobile made the first Ford Reliability tour with a perfect score,

## Lincoln Has New Landing Field

By Ray Poy

The recent purchase, by the Lincoln Standard Aircraft Co. of Lincoln, Neb., of 50 acres, south of the city of Lincoln, makes one of the best landing fields in the Middle West.



Lincoln Field at Lincoln, Neb. Left: Pilot R. Coleman. Center, P. H. Moore. Right: Pilot W. B. Muller.

has been sold to G. J. Muller of Lincoln, Ill. A new Trans Air plane has been ordered from the company and will be delivered in time for spring delivery. The Campbell-DeWolfe airplane company also has purchased another Trans plane.

Mobile aviation business are making tentative plans for an elaborate flying arena to be held on the day when the first mail is carried on the Chicago-Mobile route.

There is a move on at the present time, through the intervention of the Lincoln Standard company and the Lincoln Chamber of Commerce to make this a successful proposition. The field is located on mile South of the State Prison, which is located at the Southwest corner of the city. The field will be located and lighted with flood lights for night flying.

A contract has been let for one large hangar, 60 ft. x 120

## AIRPLANES FOR SALE

We will sell your \$119,000.00 worth of airplanes, motor and parts for \$100.00. We have a large stock of airplanes, motor and parts for sale. We have a large stock of airplanes, motor and parts for sale. We have a large stock of airplanes, motor and parts for sale.

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## WOODSON EXPRESS

Type 3-A Four Place



FOR PERFORMANCE, RELIABILITY, MANEUVERABILITY, SAFETY AND ECONOMY, THE WOODSON EXPRESS IS UN-EQUALLED.

The model will carry a payload of 400 pounds exclusive of pilot and fuel for 4 hours and has a cruising speed of 100 miles per hour and a top speed of 120 miles per hour.

FOR EXPRESS, MAIL AND PASSENGER LINES, TAXI SERVICE, MAPPING, SKY-WRITING, ETC.

Powered with either the 200 HP Sabson motor (rated at 180) or the 100 HP Wright 2-4 (rated at 100) or the 100 HP Wright 2-4 (rated at 100) or the 100 HP Wright 2-4 (rated at 100).

It Will Pay You Well To See This Plane Before You Invest in Other Equipment. We will gladly give a demonstration without obligation at any time you wish at our factory or field.

Write us today for the specifications. WOODSON ENGINEERING COMPANY, BRYAN, TEXAS.

## ALL METAL

## Planes and Parts

STIFFNESS under load has many advantages. Generally it makes a machine maintenance in strength, but sometimes it is too stiff to make it is also possible to use non-stiffness advantages.

YOU KNOW, of course, that the use of the wings are great power loading and a great metal depends upon the strength of the wings. You know, of course, that the use of the wings are great power loading and a great metal depends upon the strength of the wings.

BUT DID YOU KNOW that metal has lightness with only slightly high wing loading, or 100 lb. of the steel, you will realize in a moment that it is 10 lb. of the steel.

I DO NOT MEAN that any design look of any material will easily handle such a wing loading, but that our standard design with our intermediate rigidity under loading will do this or we prepared to demonstrate it to you. With our intermediate design, we are our complete airplanes, or airplanes, design in their details, the use of our special equipment for winged of drives, and, for use of our special equipment.

CHARLES WARD HALL, President

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126 EAST 42nd STREET NEW YORK

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## The New Curtiss O-1 "Falcon"

The Curtiss O-1 Falcon recently took first place in the Air Service competition for observation aeroplanes. The Falcon, powered with the old reliable Curtiss D-12 motor, carries a useful load of over 1700 pounds including pilot, observer, ordnance, camera, radio equipment and fuel — completely equipped to undertake the most difficult reconnaissance mission.

Intensive engineering in duralumin construction has made possible an exceptional performance. Even with the load required in an observation plane the Falcon becomes a competitor in the pursuit ship class. Having a climb of over 1200 feet per minute, its speed is 136 miles per hour at 15,000 feet and its absolute ceiling is more than 20,000 feet.

Air Services everywhere now recognize the importance of the two-place pursuit ship and the Falcon at once becomes a fore-runner of this new class.

Curtiss Aeroplane & Motor Company, Inc.

Garden City

New York

*Curtiss*